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ON FROST INJURIES TO SYCAMORE BUDS.

BY HERMANN VON SCHRENK.

The native forest trees of the temperate zone rarely show evidences of injuries due to frost. The reason for this is probably to be found in the fact that most buds start to develop at a period when severe frosts are no longer liable to occur. Frost injuries, such as are commonly found, usually occur in cultivated trees, particularly the fruit trees. Now and then, however, cold weather and heavy frosts occur during the late spring, and at such periods injuries are liable to be found in even the native trees. The extent to which native forest trees are subject to frost injury during the spring of the year is but little known at the present time. The spring of this year was characterized by extraordinarily cold weather and by heavy frosts, particularly during April and May. These frosts came at a time when buds on most trees had already begun to open, and in many instances trees had already formed leaves one to two inches in diameter. As is usual in such cases, fruit trees suffered very severely. The blossoms on apple and peach trees were almost universally killed throughout Missouri and northward, and in many localities in the Eastern States.

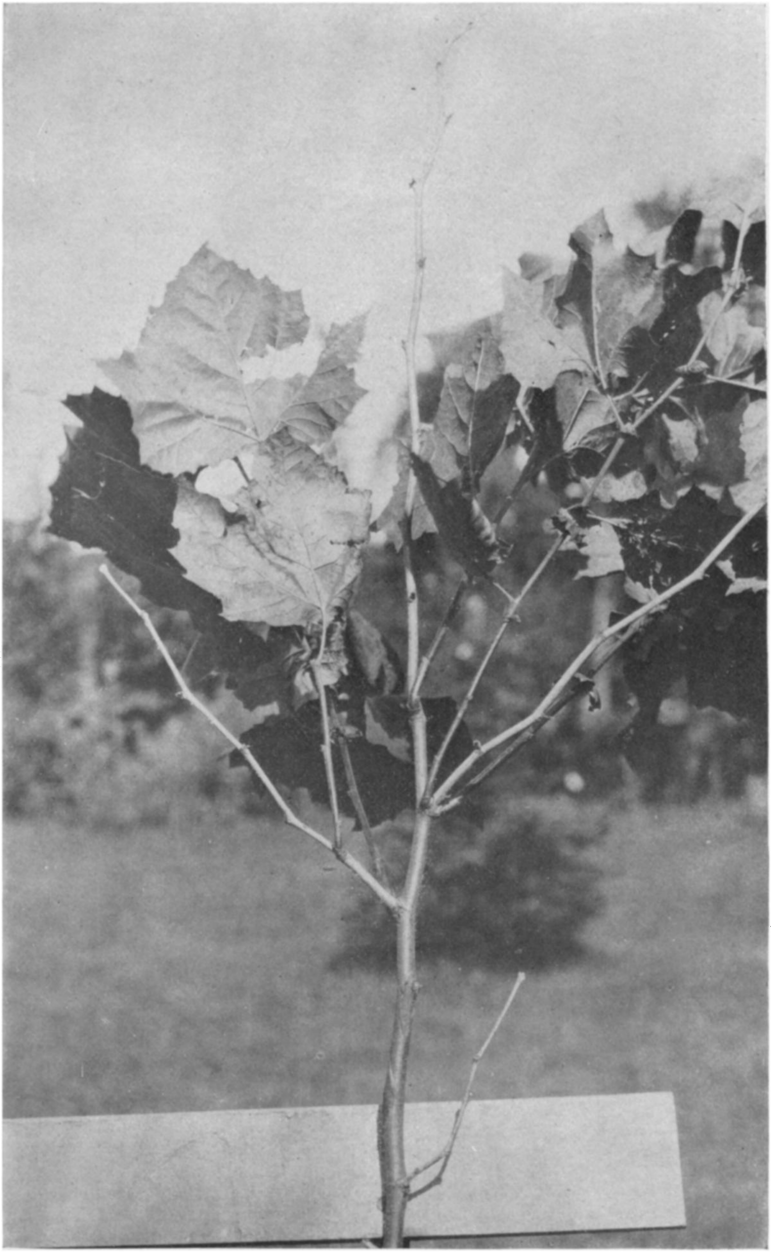
By the middle of May, most forest trees, especially maples, sycamores, elms, poplars, etc., had developed leaves of considerable size. After the last considerable frost, notes were made in the vicinity of St. Louis and in New Jersey concerning the extent to which the various species of trees had been influenced by the frost. With the exception of the sycamore, most trees showed but slight injury. Some of the youngest leaves were killed at the edges, but hardly any of them were killed outright. The young leaves of the sycamore, on the other hand, were very universally killed entirely. A few days after the frost, the edges of these leaves turned reddish and ultimately brown, and some weeks after, the leaves were thoroughly dry and papery. Many of the buds which were just then opening were likewise killed, especially those near the outer ends of young branches. By the middle of June, the sycamore trees, which at this time of the year are usually well covered with leaves, appeared as bare as they do in February. The injury to sycamores noted about St. Louis occurred universally to a considerable distance south of St. Louis and as far east as the Atlantic seaboard, extending through Illinois, Indiana, Ohio, Pennsylvania, New Jersey and New York. For a month or more after the frost injury, there were no signs of development, and a cursory examination of the trees gave the impression that the trees had been killed outright. Small clumps of undeveloped leaves remained attached to the smaller branches and the trees had all appearances of having been severely frozen. By the end of June, many buds which had not been killed, started to develop. In most instances, these buds were confined to the lower ends of the branches; in other words, they consisted either of first or second buds, counting from the point of origin of the branch. (See plate 7, lowest branch to the left). These buds developed in the usual course into branches. The frost had evidently killed all of the outer buds and by the end of August, a large percentage of the sycamore trees showed long dead branches mixed in with the foliage which had developed since the end of June.

In numerous instances, all of the buds on the one year old branches had been killed. In such cases, one or more adventitious buds developed at the base of the branch, usually one on each side of its insertion (see plate 7, right side of figure). These buds developed with extraordinary rapidity, and by the end of August, the branches developed therefrom had the length commonly attained by branches developed from buds which had opened in a normal manner at the beginning of May. The conditions of several branches as they were found toward the end of August in northern New Jersey are illustrated on plate 7.

Sycamore trees by the end of August appeared as if they had less than half of the leaves usually found on the branches. The entire crown is filled with long, dead twigs around the base of which bushy masses of leaves have developed. The injury, therefore, was simply a temporary one, and unless a similar injury is repeated during the next year, the trees will probably not have suffered permanently.

EXPLANATION OF PLATE.

Plate 7.—Branch of sycamore injured by frost, photographed two months after the injury.



FROST INJURY OF SYCAMORE.